

REMARKS

The pending claims are 1-16, which are identical to those claims originally allowed in the patent (except for minor amendments made to clarify the invention), independent claim 27, and independent claim 30. Each of claims 17-26, and 28-29, added by amendments during the pendency of the parent reissue applications to this case, have been canceled.

By this Amendment, the specification, and claims 27 and 30, have each been amended to clarify that which applicants' regard as the invention in response to rejections under 35 U.S.C. § 112. Applicants' respectfully request entry of this Amendment because the amendments present rejected claims 27 and 30 in better form for consideration on appeal.

Applicants' propose amending two paragraphs of the specification (at column 3, lines 28-40; and at column 5, lines 23-38) to clarify the description and provide verbatim correspondence between the specification and each of claims 27 and 30. No new matter is added, since support for the added language to these paragraphs is clearly found in Figures 1 and 2, which clearly illustrate that the lower platen 14 may be comprised of a plurality of elongated quench tubes 32 which are substantially parallel to each other. Moreover, it is clear from Figures 2 and 3 that the drive shafts 28, 38 for each of the lower platen 14 and upper platen 18 extend between and are supported by the elongated quench tubes, and are oriented substantially perpendicular to the tubes. Finally, Figures 1-3 clearly indicate that the orientation of the deformable drive shafts 28, 38 and the drive wheels 30, 40 mounted thereon will cause the lower and upper platens to be deformable to bend the heated glass sheet about a direction parallel to the elongated direction of the quench tubes. For these reasons, applicants' respectfully request entry of these proposed amendments to the specification.

Each of the amended claims along with the supporting disclosure is provided below.

27. (New) An apparatus for uniformly tempering a glass sheet comprising:

opposed lower and upper platens

each of which includes elongated quench tubes which are substantially parallel to each other and have quench openings

the lower platen having deformable drive shafts which extend between the elongated quench tubes thereof and are oriented to be substantially perpendicular to those quench tubes and which are rotatably supported by those quench tubes, and

the lower platen also having drive wheels supported on the deformable drive shafts thereof at spaced locations to engage and move the glass sheet

an actuator connected to the lower platen for moving the quench tubes of the lower and upper platens as a glass sheet is bent about a direction parallel to the elongated direction of the quench tubes to generally conform the tubes to the shape of the bent glass sheet;

a glass bending and tempering apparatus
Col. 4, ll. 30-31.

The bending and tempering apparatus includes a support that mounts the opposed bending platens at upper and lower locations with respect to each other
Col. 3, ll. 9-12; Col. 5, ll. 23-25.

A plurality of elongated [Q]quench tubes which are substantially parallel to each other define the quench openings of the lower platen.
Col. 3, ll. 32-33; Figs. 1-3.

elongated, substantially parallel quench tubes define the quench openings of the upper platen
Col. 3, ll. 38-39; Figs. 1-3.

The lower platen includes deformable drive shafts, drive wheels mounted on the drive shafts to engage the heated glass sheet and provide movement thereof during platen deformation that provides the bending. A plurality of elongated [Q]quench tubes which are substantially parallel to each other define the quench openings of the lower platen. The drive shafts extend between the elongated quench tubes, are oriented to be substantially perpendicular to those quench tubes
Col. 3, ll. 28-35.; Figs. 1-3.

The lower platen 22 is deformable and has a connection to actuator 16 so as to deform the lower platen from the planar shape to the bent shape. The upper platen 22 is initially conformingly deformable to the shape of the lower platen 14 as the heated glass sheet 12 is moved with the lower platen and bent between the platens about a direction parallel to the elongated direction of the quench tubes.
Col. 5, ll. 26-30; Figs 1-4.

and means to supply quenching gas through the quench tubes to uniformly temper a glass sheet therebetween.

Quenching gas is supplied to the quench openings of both platens 14,22 and thereby to both sides of glass sheet 12 to temper the bent glass sheet between the platens.

Col. 5, ll. 10-13.

30. (New) A glass sheet bending and tempering apparatus comprising:

a glass bending and tempering apparatus

Col. 4, ll. 30-31.

lower and upper opposed deformable platens

The bending and tempering apparatus includes a support that mounts the opposed bending platens at upper and lower locations with respect to each other

Col. 3, ll. 9-12; Col. 5, ll. 23-25.

each of which includes elongated quench tubes which are substantially parallel to each other and have quench openings;

A plurality of elongated [Q]quench tubes which are substantially parallel to each other define the quench openings of the lower platen.

Col. 3, ll. 32-33; Figs. 1-3.

elongated, substantially parallel quench tubes define the quench openings of the upper platen

Col. 3, ll. 38-39; Figs. 1-3.

the lower platen having deformable drive shafts which extend between the elongated quench tubes thereof and are oriented to be substantially perpendicular to those quench tubes and which are rotatably supported by those quench tubes, and the lower platen also having drive wheels supported on the deformable drive shafts thereof at spaced locations to engage and move the glass sheet to be bent;

The lower platen includes deformable drive shafts, drive wheels mounted on the drive shafts to engage the heated glass sheet and provide movement thereof during platen deformation that provides the bending. A plurality of elongated [Q]quench tubes which are substantially parallel to each other define the quench openings of the lower platen. The drive shafts extend between the elongated quench tubes, are oriented to be substantially perpendicular to those quench

the upper platen having idler shafts mounted on the elongated quench tubes thereof and also having idler wheels mounted by the idler shafts at spaced locations to engage the glass sheet to be bent;

actuating means for causing deformation of the lower platen with the upper platen being conformably deformable to the shape of the lower platen as the lower platen is bent about a direction parallel to the elongated direction of the quench tubes from a flat shape to a bent shape with the glass sheet disposed between the platens as the quench openings of the elongated quench tubes and

the wheels are moved with the platens as the wheels engage and bend the glass sheet;

means to supply quenching gas to the quench openings of both platens after

tubes

Col. 3, ll. 28-35.; Figs. 1-3.

the upper platen 22 includes idler shafts 38 and idler wheels 40 mounted on the idler shafts to engage the heated glass sheet 12 and to rotate with movement of the glass sheet. As with the lower platen 14, quench tubes 32 define the quench openings 18 of the upper platen 22 and rotatably support the idler shafts 38.

Col. 5, ll. 54-60.

The lower platen 22 is deformable and has a connection to actuator 16 so as to deform the lower platen from the planar shape to the bent shape. The upper platen 22 is initially conformingly deformable to the shape of the lower platen 14 as the heated glass sheet 12 is moved with the lower platen and bent between the platens about a direction parallel to the elongated direction of the quench tubes. Both of the platens 14,22 subsequently conform to the shape of template 24 as the lower platen 14 is moved toward the template and the glass sheet is bent to its final bent shape. Both of the platens 14,22 include quench openings 18 that move with the platens during the deformation of the platens and subsequently supply quenching gas to temper the bent glass sheet.

Col. 5, ll. 26-38; Figs. 2-3.

the upper platen 22 includes idler shafts 38 and idler wheels 40 mounted on the idler shafts to engage the heated glass sheet 12 and to rotate with movement of the glass sheet. As with the lower platen 14, quench tubes 32 define the quench openings 18 of the upper platen 22 and rotatably support the idler shafts 38.

Col. 5, ll. 54-60.

Quenching gas is supplied to the quench openings of both platens 14,22 and thereby

bending has finished to thereby temper the bent glass sheet between the platens;

and drive means for reversibly driving the drive wheels to move the glass sheets during the bending and tempering of the glass sheet.

to both sides of glass sheet 12 to temper the bent glass sheet between the platens.

Col. 5, ll. 10-13.

A control 34 and reversible drive electric motors 36 drive drive wheels 30 to index the glass sheet 12 into the glass bending and tempering apparatus, oscillate the glass sheet during the bending and tempering

Col. 5, ll. 47-51.

As noted, support for the above amendments is also provided by the figures, particularly Figures 1, 2 and 3, as well as elsewhere throughout the description.

Claim 27 was rejected under 36 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), as the time the application was filed, had possession of the claimed invention. In particular, claim 27 was rejected under this section for the reason that the claim "has no support for moving or changing the position of a surface of the quench tubes so as to conform to the glass sheet which is intended to be tempered. There is no enablement for a stand alone tempering apparatus which moves to conform to the shape of a bent glass sheet."

Applicants' again traverse the rejection of claim 27. As previously noted it is clear from the drawings and specification that applicants invented an improved quench as well as a combined bending and quenching apparatus. Applicants specifically recognized the problem of efficiently quenching bent glass:

...once the glass sheet arrives at the quenching station, the quenching air typically is applied in a nonuniform manner with respect to the bend in the bent glass sheet causing unbalanced rates of cooling over the surface of the glass sheet.

Col. 1, ll. 52-56.

Applicants further noted that one object of their invention related specifically to tempering:

Another object of the invention is to provide an apparatus that has movable quench openings that move with the surfaces of the flat glass sheet to provide equal thermal conditions during tempering in a more uniformly tempered glass sheet.

Col. 2, ll. 38-42.

The Abstract also recognizes the quenching apparatus as an independent feature of the invention:

Quenching gas is supplied by both platens (14,22) through quench openings (18) that move with the platen (14,22) to temper the bent glass sheet between the platens.

Thus, though the illustrated embodiments show bending and quenching at a single location, it is clear that applicants contemplated novel and unobvious improvements to both a bending apparatus and a quenching apparatus.

Finally, Applicants again note that the improved quench was clearly contemplated as their invention, as evidenced by the original title, "Bent Glass Sheet Quench," given application Serial No. 07/083,675 (the application for the '527 patent that is the subject of this reissue application) when it was filed on August 7, 1987.

Claim 27 was also rejected under 35 U.S.C. § 112, second paragraph as being indefinite. As amended, claim 27 now specifies that the glass sheet is bent about a direction parallel to the elongated direction of the quench tubes. This direction of bending is clearly evident from the drawings, particularly Figures 1-3, and the clarifying language of amended claim 27 is now, therefore, believed to particularly point out and distinctly claim the subject matter which applicant regards as the invention in satisfaction of Section 112. For these reasons, as well as for the reasons cited in the parent applications to this reissue application, Applicants respectfully request reconsideration and allowance of claim 27.

Claim 30 was also rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, has possession of the claimed invention. This amendment to the specification, clearly supported by Figures 1-3, now provide antecedent basis for amended claim 30. As such, this claim is now also believed to satisfy the requisites of Section 112.


In light of the foregoing, as well as for the reasons set forth in applicants' prior amendments in this and the parent reissue cases, reconsideration and allowance of claims 27 and 30 is requested.

The Examiner is urged to contact the undersigned attorney by telephone to discuss any matters pertaining to this reissue application if he believes it will be useful in expediting this application.

A check in the amount of \$340.00 (\$190.00 2 Month Extension Fee & \$150.00 Notice of Appeal Fee) is enclosed to cover the Petition fee. Please charge any additional fees or credit any overpayments as a result of the filing of this paper to our Deposit Account No. 02-3978 -- a duplicate of this paper is enclosed for that purpose.

Respectfully submitted,

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